

### **REMARKS**

Applicants respectfully request that the Amendment and Response to Final Office Action be admitted under 37 C.F.R. 1.116. Applicants submit that this amendment presents claims in better form for consideration on appeal. Furthermore, applicants believe that consideration of this amendment could lead to favorable action that would remove one or more issues for appeal. Applicants submit that thus there is good and sufficient reason why this amendment should be admitted now. Reconsideration of this application, as amended, is respectfully requested. Claims 45-47, 49-56 and 58-64 are pending. Claims 45-47, 49-56 and 58-64 stand rejected.

Claims 45, 46, 54, and 60 have been amended. Claims 49, 55, 56, 58, 59, and 64 have been cancelled. Claims 65 - 69 have been added. Support for the amendments is found in the specification, the drawings, and in the claims as originally filed. Applicants submit that the amendments do not add new matter.

### **Rejections Under 35 U.S.C. § 112**

The Examiner has rejected claim 49 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. The Examiner has stated that

The mechanical hardness of the coating in this instance is claimed to be less than the hardness of wafer. Since the apparatus is capable of processing wafers of many different materials and hardness, the hardness of the wafer would be indefinite. By comparison therefore, the claimed hardness of the coating layer will also be indefinite. Range of mechanical hardness given in standard units would overcome this rejection.

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In response, applicants have cancelled claim 49.

**Rejections Under 35 U.S.C. § 103(a)**

Claims 45-47, 50, 55-56 and 58-59 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,149,727 of Yoshioka, et al. (“Yoshioka”) in view of U.S. Patent No. 6,120,660 of Chu, et al. (“Chu”).

The Examiner has rejected claims 45-47, 50, 55-56 and 58-59 under 35 U.S.C. § 103 as being unpatentable over Yoshioka in view of Chu. The Examiner has stated that

Yoshioka, et al. disclose a process chamber comprising a media delivery member (Fig. 1-9), a spin chuck (Fig. 1-20), a vacuum line coupled to the spin chuck (Fig. 1-2), the wafer support surface area smaller than the wafer (Fig. 1-20), plurality of point contact support structures (Fig. 2 and Fig. 3-27) and a line contact vacuum ring. (Fig. 2-24).

Yoshioka, et al. do not disclose a coating layer of silicon oxide on the spin chuck including point contacts.

Chu, et al. disclose a susceptor coated by a silicon-bearing compound (Col. 6, lines 48-60) like silicon dioxide (Col. 12, claim 5). The thickness of the coating is disclosed to be 0.5-2.0 micron (Col. 7, lines 18-19). Chu, et al. also teach that a silicon-bearing compound for protective layer is especially useful when a silicon substrate is used (Col. 6, line 67).

Therefore it would have been obvious to one having ordinary skill in the art at the time invention was made to have a silicon based (silicon oxide) coating on the spin chuck including point contact structures to reduce micro-contamination, especially as silicon is generally the material of substrates for processing on the spin chuck and increase operating life of the chuck due to reduced abrasion.

Regarding claim 50, as the material of the coating is silicon oxide its hardness is generally less than the hardness of silicon. Moreover, as hardness of coating layer depends upon process conditions, it would be controllable within the range.

(p. 2-3 Office Action 6/16/03)

Claims 51-54 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,149,727 of Yoshioka, et al. (“Yoshioka”) in view of U.S. Patent No. 6,120,660 of Chu, et al. (“Chu”) as applied to claim 45, and further in view of U.S. Patent No. 5,904,778 of Lu, et al. (“Lu”). The Examiner has stated that

Yoshioka, et al. do not disclose the thickness of the silicon-bearing layer.

Lu, et al. disclose a protective layer of silicon carbide less than 100 micron (Col. 6, lines 21-22) enough for protection. Too thick coatings could have a problem of peeling off.

Therefore, it would have been obvious to one having ordinary skill in the art at the time invention was made to make sure the thickness of the protective coating is enough for protection as too thick layers may not be stable.

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Claims 60-63 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,149,727 of Yoshioka, et al. ("Yoshioka") in view of U.S. Patent No. 6,120,660 of Chu, et al. ("Chu") as applied to claim 45, and further in view of U.S. Patent No. 6,110,284 of Chen, et al. ("Chen"). The Examiner has stated that

Yoshioka, et al. do not disclose a skirt around the periphery of the wafer support surface.

Chen, et al. disclose a skirt for thermal shielding around the periphery of the wafer support surface (Fig. 1-48), which does not support the substrate and is of a size that the total is greater than the size of substrate.

Therefore it would have been obvious to one having ordinary skill in the art at the time invention was made to have a skirt of thermal shield material so as to provide temperature uniformity on the substrate support surface.

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Claim 64 stands rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,149,727 of Yoshioka, et al. ("Yoshioka") in view of U.S. Patent No. 6,120,660 of Chu, et al. ("Chu") as applied to claim 45, and further in view of U.S. Patent No. 6,306,455 of Takamori, et al. ("Takamori"). The Examiner has stated that

Yoshioka, et al. do not disclose a wafer transporter.

Takamori, et al. disclose a transport means for the spin chuck (Fig. 7-22 and Col. 3, lines 19-20).

Therefore it would have been obvious to one having ordinary skill in the art at the time invention was made to have transport means for higher throughput.

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Applicants respectfully submit, however, that amended claim 45 is not rendered obvious under 35 U.S.C. § 103 by Yoshioka in view of Chu. Amended claim 45 includes the following limitations.

An apparatus for delivering media to a wafer, comprising:  
a housing defining a process chamber; and  
a spin chuck positioned in the process chamber, the spin chuck  
having a wafer support surface, the wafer support surface coated with a  
coating layer such that at least a portion of a particulate matter on the wafer  
support surface is encapsulated by the coating layer.

(Amended claim 45) (emphasis added).

In contrast, neither Yoshioka nor Chu, alone or in combination, disclose the limitation of a coating layer that encapsulates particulate matter on the wafer support surface. Yoshioka does not disclose a coating layer as stated by the Examiner. Chu does not disclose a coating layer that encapsulates particulate matter on the wafer support surface. The coating layer in Chu does not attempt to encapsulate particulate matter. Rather, Chu discloses a susceptor that is coated with a silicon bearing material, so as to reduce impurities that may “sputter” off the susceptor. That is, Chu addresses the prior art drawback that during ion implantation of the substrate, the voltage differential between the plasma and the substrate cause impurities emanating from the susceptor to be implanted in the substrate. Chu, therefore, coats the susceptor with a material that is “the same or similar material” as the substrate so that, when, during ion implantation, a silicon bearing compound is sputtered off the susceptor coating and deposited on the substrate, substantially no damage occurs to the substrate.

Chu addresses impurities emanating from the susceptor material itself and not impurities on the surface of the susceptor. Therefore, Chu does not disclose a coating layer that encapsulates impurities on the surface of the wafer support surface.

For these reasons, applicants respectfully submit that amended claim 45 is not rendered obvious by Yoshioka in view of Chu. Given that claims 46, 47, 50 – 54, 60 – 63, and 65 - 67 depend, directly or indirectly from claim 45, applicants respectfully submit that claims 46, 47, 50 – 54, 60 – 63, and 65 - 67 are, likewise, not rendered obvious by Yoshioka in view of Chu, nor by Yoshioka in view of Chu in combination with the other cited references.

Moreover, given that new claim 68 includes the limitation of a coating layer that encapsulates impurities on the surface of the wafer support surface, and given that new claim 69 depends from claim 68, applicants respectfully submit that claims 68 and 69 are, likewise, not rendered obvious by Yoshioka in view of Chu, nor by Yoshioka in view of Chu in combination with the other cited references.


It is also respectfully submitted that Yoshioka does not teach or suggest a combination with Chu and that Chu does not teach or suggest a combination with Yoshioka. It would be impermissible hindsight based on applicants' own disclosure to incorporate the plasma immersion ion implantation system of Chu into the "rotating substrate" processing apparatus of Yoshioka. That is, because the teachings of Yoshioka are disclosed within the context of processes such as applying photoresist and developer, while the teachings of Chu are disclosed within the context of a plasma implantation process, there is no suggestion or motivation to combine such teachings.

As discussed above, such a combination would still lack a coating layer that encapsulates impurities on the surface of the wafer support surface.

It is respectfully submitted that in view of the amendments and arguments set forth herein, the applicable rejections and objections have been overcome. If there are any additional charges, please charge Deposit Account No. 02-2666 for any fee deficiency that may be due.

Respectfully submitted,

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